AI MINI PROJECT - BITCOIN PREDICTION

What is Bitcoin?

Bitcoin (₿) may be a cryptocurrency. it's a decentralized digital currency without a financial institution or single administrator which will be sent from user to user on the peer-to-peer bitcoin network without the necessity for intermediaries

Why is Bitcoin important?

Bitcoin is vital due to the technology that creates it. That technology is named blockchain computing and you will be hearing more about it

Blockchain Computing

Blockchain computing may be a system which will securely contain a whole set of records within it, mentioned as blocks. What makes blockchain computing unique is that copies of the whole system are often kept simultaneously on many computers located anywhere. Even as the web obsoleted the hub and spoke nature of a network, blockchain technology does away with the thought that information is stored during a limited number of locations. Blockchain allows information to reside on multiple systems, even many of them, simultaneously. When a replacement entry is formed into the blockchain, the whole system updates in every location, instantly. a vast number of copies of the whole system, updated right to this moment, is maintained everywhere within the world. Anyone can add a replacement record to the system but changing an old one would require the consent of each computer on which the info resides, it’s virtually impossible, which means the records are completely reliable.

What is a Bitcoin Prediction?

Bitcoin Price Prediction is about how Bitcoin might perform within the near future. Bitcoin's future value predictions are done through thorough research. Realistic Bitcoin predictions are often determined after determining the past trends, given the volatility nature of the crypto market. During this article, you'll inspect every aspect of Bitcoin's future forecast.

For example, Bobby Lee, CEO of China’s first exchange- BTCC said before that it might take 20 years for BTC to succeed in $1 million. Now his prediction totally changed. Bobby Lee, the co-founder of BTCC (Hong Kong-based Bitcoin exchange) and therefore the brother of Charlie Lee, Litecoin creator gave a particularly bullish prediction but started with bearish thoughts. He claims that Bitcoin might devour from late 2020 and will reach $333,000 in 2021 then fall to $41,000 in 2023. He iterated that the market capital might reach $7 trillion, which may surpass the market cap of gold. He even mentioned that Bitcoin would cause price stability and global liquidity within the coming years.

ABOUT THE PROJECT

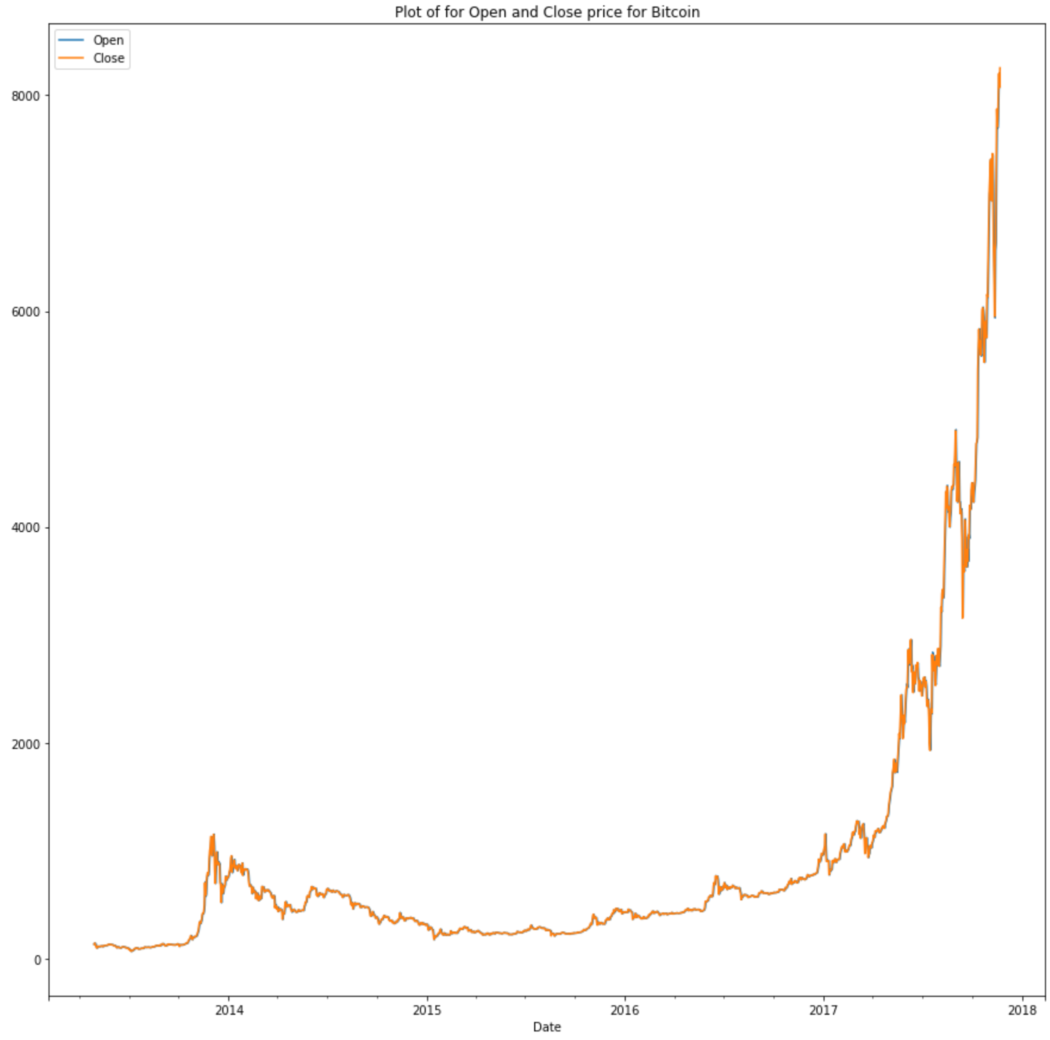
Model: Random Forest Regression

Machine Learning

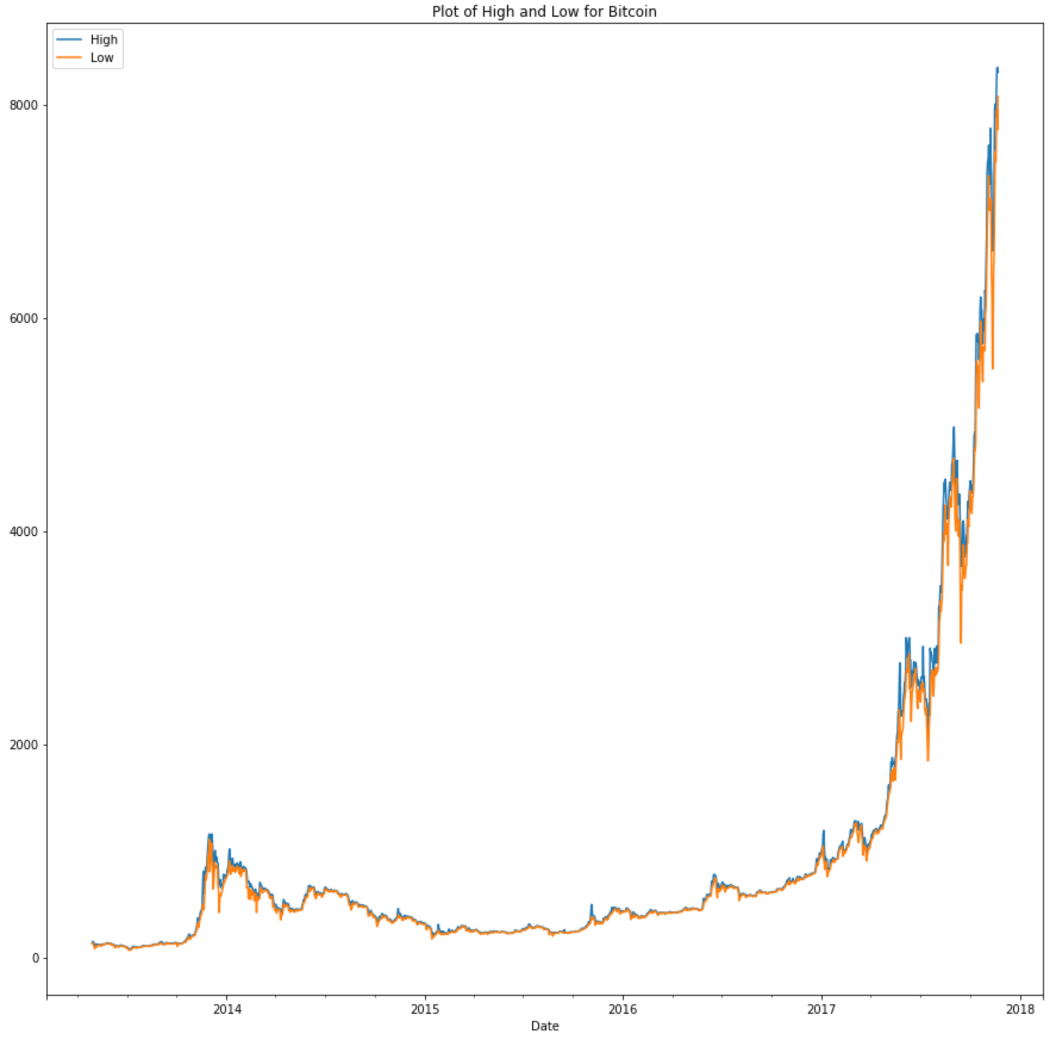
The machine learning element of this application was built using Python 3. Machine learning is the use of statistics and computation to offer systems the power to find out and improve from experience without being explicitly programmed to try to do so. Artificial neural networks, inspired by the biological networks within our brains, is the strain of machine learning which is employed within this project.

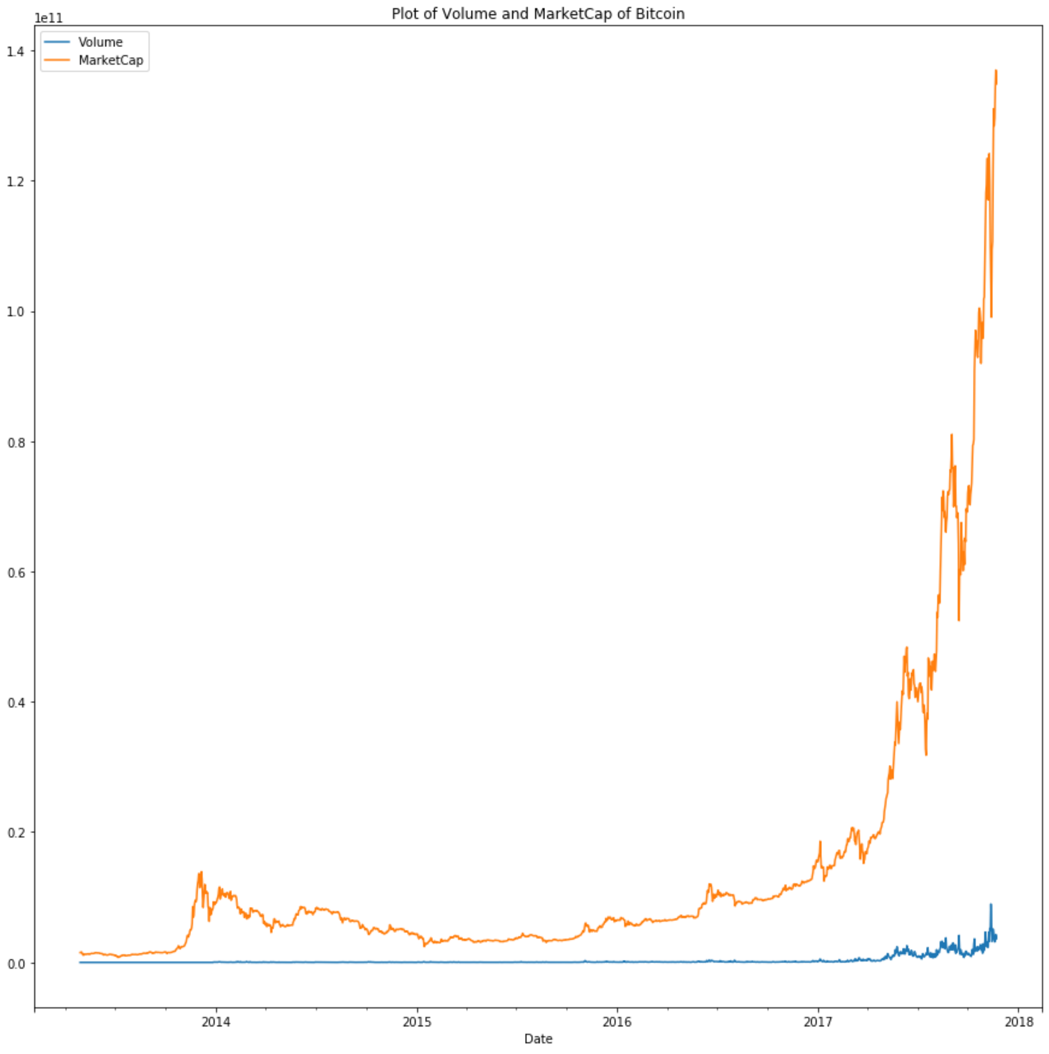
Visualizing bitcoin data

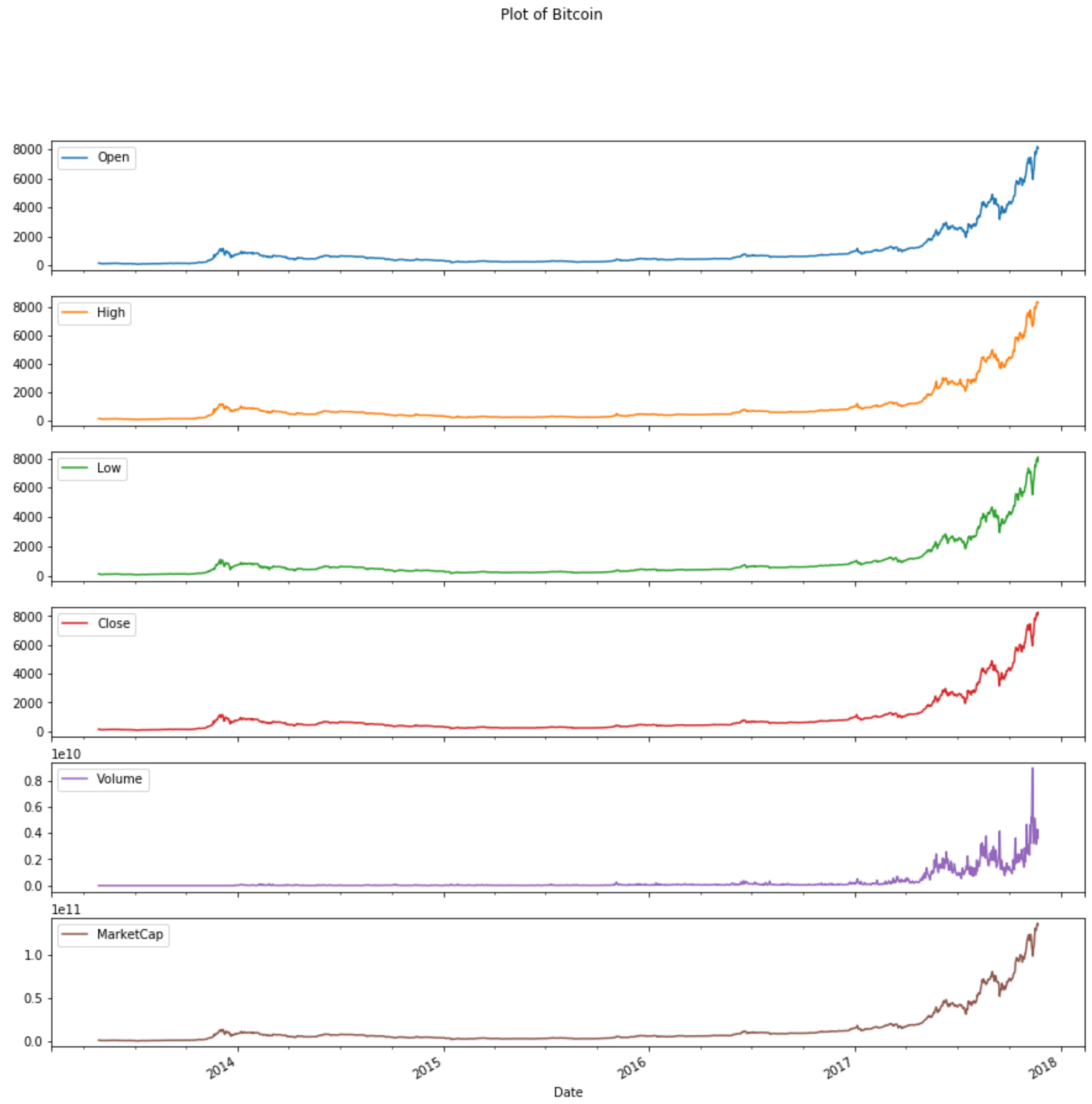
Here we can see that in 2014 the price went up but then in 2015 and 2016 it settled to low. But because of recent activities in the market, the prices are up in 2017 with significant increase. The increment is about 4 times the previous years.



Now let's see the variation in High and low over the years. The variation is quite same as the open and Close. in 2017 High and low also rose up to 4 times the previous years.




Plot of Volume and MarketCap of Bitcoin
1e11
Volume
MarketCap
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
2014
2015
2016
2017
2018
Date



Using the example of the above datasets, we extracted data from **coinmarketcap historical data** and created another dataset into .csv file, which consists of the columns: "Date", "Open", "High", "Low", "Close", "Volume", "Market Cap".

Starting date: 01-01-2015
End date: 31-03-2020

In [1]:

```
import pandas as pd
import time
import seaborn as sns
import matplotlib.pyplot as plt
import datetime
import numpy as np

#Get bitcoin market info: "Date", "Open", "High", "Low", "Close", "Volume", "Market Ca
p".
bitcoin_market_info = pd.read_csv("Bitcoin-data.csv")
bitcoin_market_info['Date'] = pd.to_datetime(bitcoin_market_info.Date)
bitcoin_market_info.sort_values(by='Date', inplace=True, ascending=True)
bitcoin_market_info = bitcoin_market_info.set_index('Date')

# Convert"Volume" to an integer.
bitcoin_market_info['Volume'] = bitcoin_market_info['Volume'].astype('int64')

# Look at the first few rows.
bitcoin_market_info.head()
```

Out[1]:

	Open	High	Low	Close	Volume	Market Cap
Date						
2015-01-01	320.43	320.43	314.00	314.25	8036550	4,297,535,768
2015-01-02	314.08	315.84	313.57	315.03	7860650	4,309,551,126
2015-01-03	314.85	315.15	281.08	281.08	33054400	3,846,269,872
2015-01-04	281.15	287.23	257.61	264.20	55629100	3,616,320,975
2015-01-05	265.08	278.34	265.08	274.47	43962800	3,758,098,008

In [2]:

```
bitcoin_market_info.columns
```

Out[2]:

```
Index(['Open', 'High', 'Low', 'Close', 'Volume', 'Market Cap'], dtype='obj
ect')
```

In [3]:

```
bitcoin_market_info.drop(['Volume','Market Cap'],axis=1,inplace=True)
```

In [4]:

```
#Only keep columns "Open", "High", "Low", "Close".
bitcoin_market_info
```

Out[4]:

	Open	High	Low	Close
Date				
2015-01-01	320.43	320.43	314.00	314.25
2015-01-02	314.08	315.84	313.57	315.03
2015-01-03	314.85	315.15	281.08	281.08
2015-01-04	281.15	287.23	257.61	264.20
2015-01-05	265.08	278.34	265.08	274.47
...	...	...	...	...
2020-03-27	6719.39	6793.84	6466.70	6469.80
2020-03-28	6467.25	6467.50	6117.84	6242.19
2020-03-29	6245.62	6250.47	5920.09	5922.04
2020-03-30	5925.54	6517.20	5903.23	6429.84
2020-03-31	6430.61	6504.52	6374.16	6438.64

1917 rows × 4 columns

In [5]:

```
#Check if any NAN values remain in the dataset
bitcoin_market_info.isnull().any()
```

Out[5]:

```
Open     False
High     False
Low      False
Close    False
dtype: bool
```

In [6]:

```
#Shape of the dataset
bitcoin_market_info.shape
```

Out[6]:

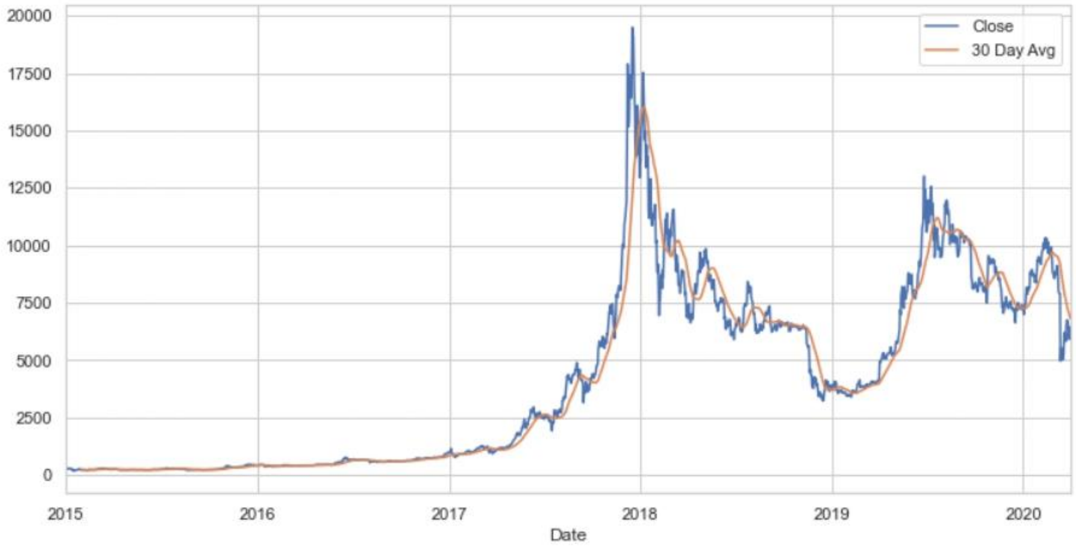
```
(1917, 4)
```

In [7]:

```
#Plotting the bitcoin_data on graph using seaborn

sns.set()
sns.set_style('whitegrid')

bitcoin_market_info = bitcoin_market_info.astype(float)

bitcoin_market_info['Close'].plot(figsize=(12,6), label='Close')

#Plotting the rolling 30 day average against the Close Price
bitcoin_market_info['Close'].rolling(window=30).mean().plot(label='30 Day Avg')
plt.legend()
```

Out[7]:

```
<matplotlib.legend.Legend at 0x28d40c11388>
```



In [8]:

```
#Calculating the OHLC Average of data for each day

btc = bitcoin_market_info
btc['OHLC_Average'] = (btc['Open'] + btc['High'] + btc['Low'] + btc['Close']) / 4
```

In [9]:

```
btc.head()
```

Out[9]:

	Open	High	Low	Close	OHLC_Average
Date					
2015-01-01	320.43	320.43	314.00	314.25	317.2775
2015-01-02	314.08	315.84	313.57	315.03	314.6300
2015-01-03	314.85	315.15	281.08	281.08	298.0400
2015-01-04	281.15	287.23	257.61	264.20	272.5475
2015-01-05	265.08	278.34	265.08	274.47	270.7425

In [10]:

```
btc['Price_After_Month']=btc['Close'].shift(-30)
```

In [11]:

```
btc.tail()
```

Out[11]:

	Open	High	Low	Close	OHLC_Average	Price_After_Month
Date						
2020-03-27	6719.39	6793.84	6466.70	6469.80	6612.4325	NaN
2020-03-28	6467.25	6467.50	6117.84	6242.19	6323.6950	NaN
2020-03-29	6245.62	6250.47	5920.09	5922.04	6084.5550	NaN
2020-03-30	5925.54	6517.20	5903.23	6429.84	6193.9525	NaN
2020-03-31	6430.61	6504.52	6374.16	6438.64	6436.9825	NaN

In [12]:

```
from sklearn import preprocessing

btc.dropna(inplace=True)
X=btc.drop('Price_After_Month',axis=1)

#We need to scale our values to input them in our model
X=preprocessing.scale(X)
y=btc['Price_After_Month']
```

In [13]:

```
from sklearn import model_selection
X_train,X_test,y_train,y_test=model_selection.train_test_split(X,y,test_size=0.3,random
_state=101)
```

In [14]:

```
from sklearn.ensemble import RandomForestRegressor
reg=RandomForestRegressor(n_estimators=200,random_state=101)
reg.fit(X_train,y_train)
accuracy=reg.score(X_test,y_test)
accuracy=accuracy*100
accuracy = float("{0:.4f}".format(accuracy))
```

In [15]:

```
#This percentage shows how much our regression fits our data
print('Accuracy is:',accuracy,'%')
```

```
Accuracy is: 87.041 %
```

In [16]:

```
preds = reg.predict(X_test)

#We can see that our predictions are kind of accurate.
print("Prediction:", preds[1], "\nReal Value:", y_test[1])
```

```
Prediction: 654.4334999999978
Real Value: 632.83
```

In [17]:

```
#Apply our model and get our prediction
#Take the last 30 elements to make our predictions on them

X_30=X[-30:]
forecast=reg.predict(X_30)
```

In [18]:

```
#Creating a new column which contains the predictions

from datetime import datetime, timedelta
last_date=btc.iloc[-1].name
modified_date = last_date + timedelta(days=1)
date=pd.date_range(modified_date,periods=30,freq='D')
df1=pd.DataFrame(forecast,columns=['Forecast'],index=date)
btc=btc.append(df1)
```

In [19]:

```
btc.tail(15)
```

Out[19]:

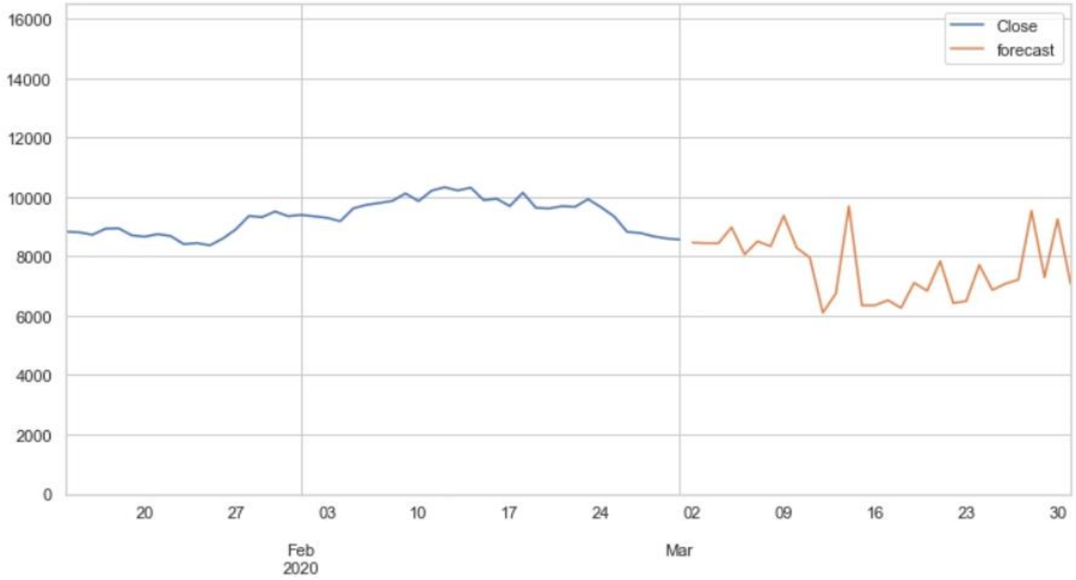
	Open	High	Low	Close	OHLC_Average	Price_After_Month	Forecast
2020-03-17	NaN	NaN	NaN	NaN	NaN	NaN	6518.19040
2020-03-18	NaN	NaN	NaN	NaN	NaN	NaN	6258.21335
2020-03-19	NaN	NaN	NaN	NaN	NaN	NaN	7102.74575
2020-03-20	NaN	NaN	NaN	NaN	NaN	NaN	6835.91975
2020-03-21	NaN	NaN	NaN	NaN	NaN	NaN	7834.97165
2020-03-22	NaN	NaN	NaN	NaN	NaN	NaN	6421.46800
2020-03-23	NaN	NaN	NaN	NaN	NaN	NaN	6489.13310
2020-03-24	NaN	NaN	NaN	NaN	NaN	NaN	7707.91640
2020-03-25	NaN	NaN	NaN	NaN	NaN	NaN	6863.88770
2020-03-26	NaN	NaN	NaN	NaN	NaN	NaN	7075.21535
2020-03-27	NaN	NaN	NaN	NaN	NaN	NaN	7212.23105
2020-03-28	NaN	NaN	NaN	NaN	NaN	NaN	9532.38425
2020-03-29	NaN	NaN	NaN	NaN	NaN	NaN	7291.40245
2020-03-30	NaN	NaN	NaN	NaN	NaN	NaN	9249.90120
2020-03-31	NaN	NaN	NaN	NaN	NaN	NaN	7072.63615

In [21]:

```
#Predictions plotted on the chart (Magnified)

btc['Close'].plot(figsize=(12,6),label='Close')
btc['Forecast'].plot(label='forecast')
plt.axis((18275, 18352, 0, 16500))
plt.legend()
```

Out[21]:

```
<matplotlib.legend.Legend at 0x28d42a75f88>
```


Close
forecast
Feb
Mar